APPENDIX B

PROJECT DESCRIPTION / INFORMATION

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Appendix B2 of the PDEA incorporates Exhibit A - Project Description in its entirety.

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APPENDIX B1
NO-ACTION ALTERNATIVE EXISTING MEASURES AND O&M PRACTICES

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Minimum Flows	Minimum Release to Low Flow Channel (this includes water that returns from hatchery)	Maintain minimum flow of 600 cubic feet per second (cfs) within the Feather River downstream of the Thermalito Diversion Dam and the Feather River Fish Hatchery. [Low Flow Channel Flow Standard]
	Minimum Release to High Flow Channel	Release water necessary to maintain flows in the Feather River below the Thermalito Afterbay Outlet in accordance with the minimum flow schedule presented in the Federal Energy Regulatory Commission (FERC) order, provided that releases will not cause Lake Oroville to be drawn below elevation 733 feet (ft) (approximately 1.5 million acre-feet [maf] of storage). If the April 1 runoff forecast in a given year indicates that the reservoir level will be drawn to 733 ft, water releases for fish may be reduced, but not by more than 25 percent.
Maximum Flows (non-flood control)	Maximum Flow into Feather River Fish Hatchery	Maximum flow into Feather River Fish Hatchery from the Diversion Pool is 115 cfs year round.
	Maximum Flow in the High Flow Channel	Maximum flow at Feather River below Thermalito Afterbay Outlet is **10,000 cfs** when Lake Oroville inflow is less than 10,000 cfs. [High Flow Channel Flow Standard] When Lake Oroville inflow is greater than 10,000 cfs, the maximum flow in the river below Thermalito Afterbay Outlet will be limited to inflow. If higher flow releases coincide with Chinook spawning activity, the ramping rate used to return to the minimum flow requirement will be chosen to avoid redd dewatering.
Ramping Rates	Ramping Rate Criteria	Flows under 2,500 cfs cannot be reduced more than **300 cfs** during any 24-hour period, except for flood releases, failures, etc. (as per the 2004 Operating Criteria and Plan [OCAP] Biological Opinion [BO]).

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Water Supply	Releases from Lake Oroville	Releases for water supply, flood control, Sacramento–San Joaquin Delta (Delta) water quality requirements, and instream flow requirements of an average of 3 million acre-feet per year (maf/year) and approximately 1 maf/year to the Feather River Service Area (FRSA) for agricultural, municipal, and industrial uses in accordance with State Water Project (SWP) contracts, California Department of Water Resources (DWR) agreements, and water rights.
	Diversions from Feather River	Diversion of an estimated 60–70 thousand acre-feet per year (taf/year) from the Feather River by senior water right holders per State Water Resources Control Board (SWRCB) licenses or permits for appropriative users.
	Lake Oroville Storage Targets	Target Lake Oroville storage on October 1 = (Last October 1 Storage – 1,000 taf)/2 + 1,000 taf.
Flood Protection/Management	Flood Protection	The Oroville Facilities are operated for flood control purposes in conformance with the flood management regulations prescribed by the Secretary of the Army under the provisions of an Act of Congress (58 Stat. 890; 33 United States Code [USC] 709). - During floods, water releases from Oroville Dam and Thermalito Afterbay Dam will not increase floodflows above those prior to project existence. Operation of the project in the interest of flood control shall be in accordance with Section 204 of the Flood Control Act of 1958. - At high flows, fluctuate releases at least every couple of days to avoid riverbank/levee damage at one level. - Avoid extended periods of flow over the quantities listed above as much as possible to minimize the risk of seepage damage to orchards adjacent to the Feather River. - Maximum allowable flow is 180,000 cfs year round at the Feather River above the Yuba River. Maximum allowable flow is 300,000 cfs year round at the Feather River below the Yuba River. - Maximum allowable flow is 320,000 cfs year round at the Feather River below the Bear River.

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Temperature Criteria/Targets	At the Feather River Fish Hatchery and Robinson Riffle	Water temperature at Robinson Riffle must be less than 65 degrees between June and September. Water temperature during the fall months, after September 15, should be suitable for fall-run Chinook salmon. Water temperature from May through August should be suitable for American shad, striped bass, etc. At the Feather River Fish Hatchery Temperature (+/- 4°F) April 1–May 15 51° May 16–May 31 55° June 1–June 15 56° June 16–August 15 60° August 16–August 31 58° September 1–September 30 52° October 1–November 30 51° December 1–March 31 no greater than 55°
	Thermalito Afterbay Temperature Control	Operate facilities pursuant to the May 1968 Joint Water Agreement.
Natural Salmonid Spawning and Rearing Habitat	Salmonid Habitat Improvement – Endangered Species Act (ESA) Species Recovery Measures	Maintain conditions in the Low Flow Channel pursuant to 1983 Operating Agreement between DFG and DWR which is to prevent damage to fish and wildlife resources from operations and construction of the project.
	Habitat Complexity Improvement	
	Spawning Gravels	1983 Agreement between DWR and the California Department of Fish and Game (DFG) establishes a process whereby DFG will recommend each year by June 1, a spawning gravel maintenance program to be implemented that calendar year.

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Salmonid Genetics	ESA Species Segregation	The Feather River Fish Hatchery is operating and management plans include activities to separate spring- and fall-run Chinook salmon through the use of tags and run timing.
Feather River Fish Hatchery	Hatchery temperature Target	Hatchery temperature target (+/-4) based on 1983 Operating Agreement between DFG and DWR: 55º, October thru May 15 59º, May 16 thru May 31 60º, June 1 thru June 15 64º, June 16 thru August 15 62º, August 16 thru August 31 56º, September
	Salmonid Marking and Monitoring Program	Current monitoring and fish tagging program involves adipose fin clipping of all steelhead and coded wire tagging a proportion (approximately 10%) of steelhead and spring-run and fall-run Chinook salmon.
	Salmonid Recovery (Production)	Feather River Fish Hatchery: DFG operates the hatchery under contract to DWR, and DWR pays all hatchery-associated expenses. Spring- and fall-run Chinook salmon and steelhead trout are reared at the hatchery. Experimental Hatchery Releases: DFG conducts experimental releases to evaluate the hatchery contribution to ocean and inland harvest, straying to other streams, and return to the Feather River.
Lower Feather River Fishery	Sturgeon Passage	Under low-flow conditions Shanghai Bench could likely prohibit or inhibit sturgeon passage in to the lower Feather River.
Sport Fishery Management	Fish Stocking – Coldwater species	Ongoing operations and maintenance (O&M) and funding per FERC agreement for annual coldwater fish stocking program in Lake Oroville. These include preparation of an interim Fishery Management Plan including a Salmonid Stocking Program and continued funding for a full-time fisheries biologist for Lake Oroville.
	Stocking Monitoring and Reporting	File Lake Oroville Fish Stocking Study reports with FERC every 90 days. Include information on fish habitat improvements in quarterly reports on fish stocking study.
	Warmwater Habitat	Habitat improvement for warmwater game fish in Lake Oroville to include: Brush shelter construction; willows and/or buttonbush slips and annual grass planting; installation and O&M for irrigation system; and channel catfish spawning structure construction.

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Thermalito Afterbay Terrestrial Habitat	Waterfowl Nesting and Foraging/ Secondary ESA Benefit for Giant Garter Snake Habitat	Continued activities to maintain existing, constructed brood ponds.
	Brood Ponds for Waterfowl Nesting	Recharge existing brood ponds. Typically occurs at 3-week intervals (seining as necessary to remove predatory bass).
	Waterfowl Nesting and Foraging	Continue to operate and maintain Thermalito Afterbay pursuant to 1983 DWR/DFG agreement.
Oroville Wildlife Area Terrestrial Habitat	Wood duck/wildlife boxes	Wood Duck Volunteer Program: DFG and DWR provide funding for the materials and the California Waterfowl Association (CWA) provides monitoring and maintenance for several hundred wood duck/wildlife boxes each year.
Vegetation and Wildlife Management	Best management practices (BMPs) to protect fish and wildlife species	Prevent damage to fish and wildlife resulting from construction or operation of the project by taking special precautions to: - Prevent discharge of silt, petroleum products, and other harmful substances or debris into the Feather River; - Prevent loss, removal, disturbance, and compaction or shifting of gravel of the Feather River channel downstream of Thermalito Diversion Dam except as appropriate for protection or improvement of fish habitat; and - Prevent the project borrow areas from becoming sources of silt or other fines during floods or serving to dissipate stream maintenance flows or serving to trap anadromous fish.
	Habitat Enhancement	Habitat Enhancement Program: DFG conducts a regular habitat enhancement program throughout the year.
	Invasive Plant Species Control	Continue to operate and maintain Thermalito Afterbay pursuant to 1983 DWR/DFG agreement.
	Management of Oroville Wildlife Area (OWA)	Agreements with DFG: DFG manages both Thermalito Afterbay and preserve locations. OWA Management Plan: DFG developed plan to provide management of OWA for the reasonable use and enjoyment by the public.
Draft Biological Assessment Measures	Signage and Vernal Pools	Post and maintain, or require third-party State agencies to do so, appropriate signage as necessary to reduce recreational-use impacts on vernal pool habitat.

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Draft Biological Assessment Measures (continued)	Vernal Pools	Survey each spring for the first 5 years, beginning in 2005, then in the spring of every other year thereafter over the remaining life of the FERC license, all vernal pools in the project baseline inventory. Surveys shall be timed just as vernal pools are drying. The annual vernal pool survey results and associated minimization and conservation measure evaluations sub-report shall be approved (via signature) by DWR's Oroville Field Division Chief. This approved sub-report shall then be integrated into the annual meeting and annual overall listed-species report.
	Vernal Pools	Implement a sediment-trapping program, using various measures to reduce and/or prevent sedimentation into vernal pool habitat. This shall initially be an experimental program. Through adaptive management over time, the best-performing measure(s) will then be selected and routinely (at least annually checked and repaired) implemented, as necessary, over the life of the FERC license.
	Vernal Pools	Abandon and then revegetate all roads that DWR determines are no longer necessary and needed to facilitate project operations or management. A particular focus of the closings shall be any roads which are currently causing siltation problems into nearby vernal pool habitat.
	ESA Coordinator	Designate a listed-Species Coordinator within DWR. The Coordinator shall be DWR's primary contact person for all communications with the U.S. Fish and Wildlife Service (USFWS).
	Bald Eagle Habitat	Develop and adopt bald eagle territory management plans for each active bald eagle nesting territory located on the reservoir proper, or on or near (<0.25 mile) any other project feature.
	Giant Garter Snake Habitat	Review all of DWR's existing gravel-mining leases that are in, or within 200 feet of, giant garter snake (GGS) habitat and identify modifications to them as necessary to be more GGS "friendly."
	Giant Garter Snake Habitat	Operate and maintain Oroville Facilities pursuant to current license. Conduct surveys prior to O&M activities to prevent effects on species.
	California Red-Legged Frog	
	Valley Elderberry Longhorn Beetle	

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Draft Biological Assessment Measures (continued)	Boat Speed Reduction to Protect Habitat in Thermalito Afterbay	Operate and maintain Oroville Facilities pursuant to current license. Conduct surveys prior to O&M activities to prevent effects on species.
Water Quality	Standards	Various flow, salinity, and other water quality standards in the Delta will continue.
	Monitoring	Continue routine water quality monitoring as part of the SWP Water Quality Monitoring Program.
	Information	DWR, at the request of other public agencies, posts health hazard information associated with impaired water quality or fish consumption.
Recreation – Lake Oroville (common to all areas)	Programmatic Elements – Monitoring	Collect visitation and capacity data for each project recreation area and report findings to FERC every 2 years.
	Programmatic Elements – Management	As under the existing license, the California Department of Parks and Recreation (DPR) manages the Lake Oroville State Recreation Area (LOSRA) recreation facilities and DFG manages the OWA.
	Programmatic Elements – Trails	Existing trails use, 2005; some trails allow horses/stock and/or prohibit equestrian use and/or bicycle use.
	Programmatic Elements – Free Access	Allow free public access to certain project waters and undeveloped adjacent project lands owned by the Licensee (subject to a number of restrictions and conditions).
	Programmatic Elements – Marketing	The website will remain. DWR will promote the Recreation Facilities consistent with other SWP facilities.
	Programmatic Elements – I&E Program	Existing Interpretation Program as part of DPR and DFG management responsibilities.
	Programmatic Elements	FERC License Coordination Unit to be located at the Oroville Field Division.

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Bidwell Canyon Boat Ramp (BR)/Campground/Day Use Area (DUA)/Marina	Parking	Operate and maintain in accordance with agreements with DPR.
	Low-Water Access	
	Boat Ramp Parking	
	Concessionaire – Camp Store Shell	
	Campground Activity Facility	
	Boarding Docks	
	Americans with Disabilities Act (ADA) Access	
	Boating Information	
	Concessionaire – Event Space	
Loafer Creek BR/DUA/ Campground/Equestrian Camp	Public Access	
	Equestrian Camping	
	Group Camping	
	Camp Activity Center	
	Swim Facility	
	Shoreline Access	
	Boarding Docks	
	Boater Information	
Lime Saddle BR/DUA/Campground/Marina	Picnic Tables and Shade Structures	
	Marina Restoration	
	Boarding Docks	
	ADA Access	

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Lime Saddle BR/DUA/Campground/Marina (continued)	Courtesy Dock	Operate and maintain in accordance with agreements with DPR.
	Shoreline Access	
	Trail Linking Campground to Marina	
	Boater Information	
	Recreational Vehicle (RV)/Tent Camping	
	Group Camping	
	Swim Facility	
	Parking	
	Low-Water Access	
Spillway BR/DUA	Low-Water Access	
	Boater Information	
	En-Route Camping	
Enterprise BR	Low-Water Access	
	Boarding Docks	
Nelson Bar Car-top BR	Boat Launch	
Vinton Gulch Car-top BR	Boat Launch	
Dark Canyon Car-top BR	Restrooms	
	Directional Signage	
Foreman Creek Car-top BR	Shoreline Day Use	
	Education	
Stringtown Car-top BR	Day Use	
	Directional Signage	

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Lake Oroville Visitors Center	Lake Oroville Visitors Center	Operate Lake Oroville Visitors Center as currently operated for project visitors and educational programs.
Saddle Dam Trailhead	Trail	Operate and maintain in accordance with agreements with DPR.
Bloomer Area Boat-in Campgrounds (BICs)	Camping	
Goat Ranch BIC	Camping	
Foreman Creek BIC	Camping	
Craig Saddle BIC	Camping	
Oroville Dam Overlook DUA	Parking	
Floating Campsites	Additional Campsites	
Upper North Fork Arm Below Poe Powerhouse	Whitewater Boater Shuttle	No existing actions or facilities.
	Whitewater Boating Information	
Recreation – Diversion Pool DUA (Northwest Side of Diversion Pool)	Day Use	Operate and maintain in accordance with agreements with DPR.
	Angling	
	Whitewater Park	
	Flexible Events Center	
Lakeland Blvd. Trail Access (Southeast Side of Diversion Pool)	Day Use	
Recreation – Low Flow Channel/Feather River Fish Hatchery	Education	Operate and maintain in accordance with agreements with DFG.
	Observational Access	
Recreation – North Thermalito Forebay	Swimming	Operate and maintain in accordance with agreements with DPR.
	Trails	

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Recreation – North Thermalito Forebay (continued)	Shoreline Access	Operate and maintain in accordance with agreements with DPR.
	Aquatics Center	
Recreation – South Thermalito Forebay	Angling	
	Trails	
	Day Use and Swimming	
Thermalito Afterbay – Wilbur Road BR	Directional Signage	Operate and maintain in accordance with agreements with DFG.
	Day Use	
Thermalito Afterbay – Monument Hill BR/DUA		
Model Aircraft Flying Area		
Oroville Wildlife Area – Thermalito Afterbay Outlet BR/DUA/Campground	Management	
	Camping	
	Regulatory Enforcement	
	Directional Signage	
	Wildland Fire Evacuation Plan	
	Additional Revenues	
	Day Use	
OWA Dispersed River and Pond Access Sites	Trash Clean-up	
	Educational and Regulatory Signage	
	Regulatory Enforcement	
	Selected Vehicular Closures	

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
OWA Dispersed River and Pond Access Sites (continued)	ADA Accessible Watchable Wildlife Sites	Operate and maintain in accordance with agreements with DFG.
Dispersed Use Sites Outside OWA	Trash Clean-up	
	Monitoring Dispersed Sites	
Cultural Resources	Historic Properties Management Plan	Operate and maintain Oroville Facilities pursuant to current license. Conduct surveys prior to O&M activities to prevent effects on cultural resources.
	Mortar Cupules Relocation	
	Access Restrictions	
	Elimination of Wheeled Access to Fluctuation Zone	
	Site Stewardship Program	Current Site Stewardship Program as administered by DPR would continue.
	Traditional Planting and Harvesting	Operate and maintain Oroville Facilities pursuant to current license. Conduct surveys prior to O&M activities to prevent effects on cultural resources.
	Educational Signage	
	Curation Facility	
Land Use, Management, and Aesthetics	Storage Material Screening	Operate and maintain Oroville Facilities pursuant to current license.
	Dredged Material Disposal	Any dredged or excavated material shall be removed and deposited so it will not interfere with navigation.
	Fuel Load Management Plan	Operate and maintain Oroville Facilities pursuant to current license.
	Vector Management	Mosquito Abatement Programs: Up to $40,000 per year is paid to the local Mosquito Abatement District.

Table B1-1. Measures and projects to be continued under the No-Action Alternative.

Type of Measure	Title	Description
Land Use, Management, and Aesthetics (continued)	BLM Lands Transfer	Continue discussions with BLM about BLM land acquisitions of property within FERC project boundary.
	McCabe Creek Debris Management	DWR currently collects and removes debris at McCabe Creek.

Table B1-2. Existing O&M practices to be continued under the No-Action Alternative.

Type of Activity	Typical Activities
Seismic Monitoring	• Conduct surveys to monitor vertical and horizontal movement and lateral displacement of dams, structures, plants, and appurtenant features. • Provide project surveillance and instrumentation to monitor structural integrity of dams, structures, plants, and appurtenant features. • Operate and maintain strong-motion accelerographs installed in and on DWR structures. • Maintain, record, and analyze data for a Statewide telemetered array of seismographic stations. • Report earthquakes of magnitude 3.7 and greater to the Division of Safety of Dams (DSOD) or DWR. • Prepare seismicity report every 5 years to note trends that could affect project facilities.
Routine Repairs and Maintenance	• Perform routine maintenance and repair to outlet structures, release facilities, valving, piping, slide gates, radial gates, controls/load centers, transformers, and cranes. • Perform routine and annual maintenance and repairs to electrical, mechanical, and control systems equipment at the Hyatt Pumping-Generating Plant and Hyatt Intake Shutters, the Thermalito Pumping-Generating Plant, and the Thermalito Diversion Dam Power Plant. • Seal and repair masonry structures to avoid foundation failures. • Remove debris and repair erosion from overchute, underdrains, intake, and discharge channels to promote cross drainage. • Sandblast, repair, and recoat stop logs, rusted parts, and radial gates. • Perform routine maintenance and repair to fish facilities; pumps; motors; load centers; control centers; standby engine generators; lighting; ultraviolet facilities; valving; piping; gear operators; water chillers; heating, ventilation, and air conditioning (HVAC) systems; and all equipment exceeding 480 volts. • Repair roads and rights-of-way, embankments, dams, hydraulic structures, the Feather River Fish Hatchery, protected devices, gates, signs, bridges, and fences.
Monitoring, Tests, and Inspections	• Perform roof inspections and normal maintenance of buildings (including janitorial services), landscaping, and bike trails. • Repaint interior and exterior of plant facilities and buildings. • Monitor water quality by conducting water quality testing. • Monitor levels of combustible gases dissolved in transformer insulating oil and metals in lubricating oil. • Develop and implement annual Pest Management Program and conduct routine inspections to ensure structural integrity and efficient water operations. • Conduct high-voltage insulation testing of stator windings, power transformers, busings, oil, coupling capacitors, surge arresters, circuit breakers, and voltage and current transformers.

Table B1-2. Existing O&M practices to be continued under the No-Action Alternative.

Type of Activity	Typical Activities
Other Activities	• Perform flow, pressure, strain, vibration, timing, and other specialized tests as needed to diagnose and correct operations, maintenance, and other problems associated with plant apparatus and systems. • Provide preventive, proactive, and reactive electrical and mechanical maintenance on pumping plants, switchyards, and surge tanks. • Provide 24-hour shift coverage of power plant operations. • Install stop logs and scaffolding for removal of pumps and valves in pumping plants. • Convey water from Lake Oroville through Thermalito Forebay and Thermalito Afterbay for local distribution and to meet downstream requirements. • Store Feather River water in Lake Oroville to meet downstream requirements and to satisfy flood control requirements. • Collect data and provide input to the DWR Cooperative Snow Survey program and provide water measurement of inflow to Lake Oroville and downstream releases. • Clear and dispose of debris on Lake Oroville. • Operate and perform minor maintenance on light and heavy mobile equipment. • Conduct studies pertaining to emergency operations and hazardous materials management to improve operation and maintenance of facilities. • Perform herbicide and insecticide spraying.

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State of California
The Resources Agency
Department of Water Resources

EXHIBIT A
PROJECT DESCRIPTION

Oroville Facilities
FERC Project No. 2100

January 2005

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EXHIBIT A
PROJECT DESCRIPTION

The following information is provided in compliance with the requirements of CFR 18, Chapter 1, Subchapter B, §4.51(b).

1.0 GENERAL PROJECT DESCRIPTION

1.1 OVERVIEW

The Oroville Facilities (FERC Project No. 2100) were developed as part of the State Water Project (SWP), a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants. The main purpose of the SWP is to store and distribute water to supplement the needs of urban and agricultural water users in northern California, the San Francisco Bay area, the San Joaquin Valley, and southern California. The Oroville Facilities are also operated for flood management, power generation, water quality improvement in the Delta, and recreation and fish and wildlife enhancement.

FERC Project No. 2100 encompasses 41,100 acres and includes Oroville Dam and Reservoir, three power plants (Hyatt Pumping-Generating Plant, Thermalito Diversion Dam Powerplant, and Thermalito Pumping-Generating Plant), Thermalito Diversion Dam, the Feather River Fish Hatchery and Fish Barrier Dam, Thermalito Power Canal, Oroville Wildlife Area (OWA), Thermalito Forebay and Forebay Dam, Thermalito Afterbay and Afterbay Dam, and transmission lines, as well as a number of recreational facilities. An overview of these facilities is provided on Figure A.1.1-1. The Oroville Dam, along with two small saddle dams, impounds Lake Oroville, a 3.5 million acre-feet (maf) capacity storage reservoir with a surface area of 15,810 acres at its normal maximum operating level.

1.2 EXISTING POWER FACILITIES

The hydroelectric facilities have a combined license generating capacity of approximately 762 megawatts (MW). The Hyatt Pumping-Generating Plant is the largest of the three power plants with a capacity of 645 MW. Water from the six-unit underground power plant (three conventional generating and three pumping-generating units) is discharged through two tunnels into the Feather River just downstream of Oroville Dam. The plant has a generating and pumping flow capacity of 16,950 cfs and 5,610 cfs, respectively. Other generation facilities include the 3 MW Thermalito Diversion Dam Powerplant and the 114 MW Thermalito Pumping-Generating Plant.

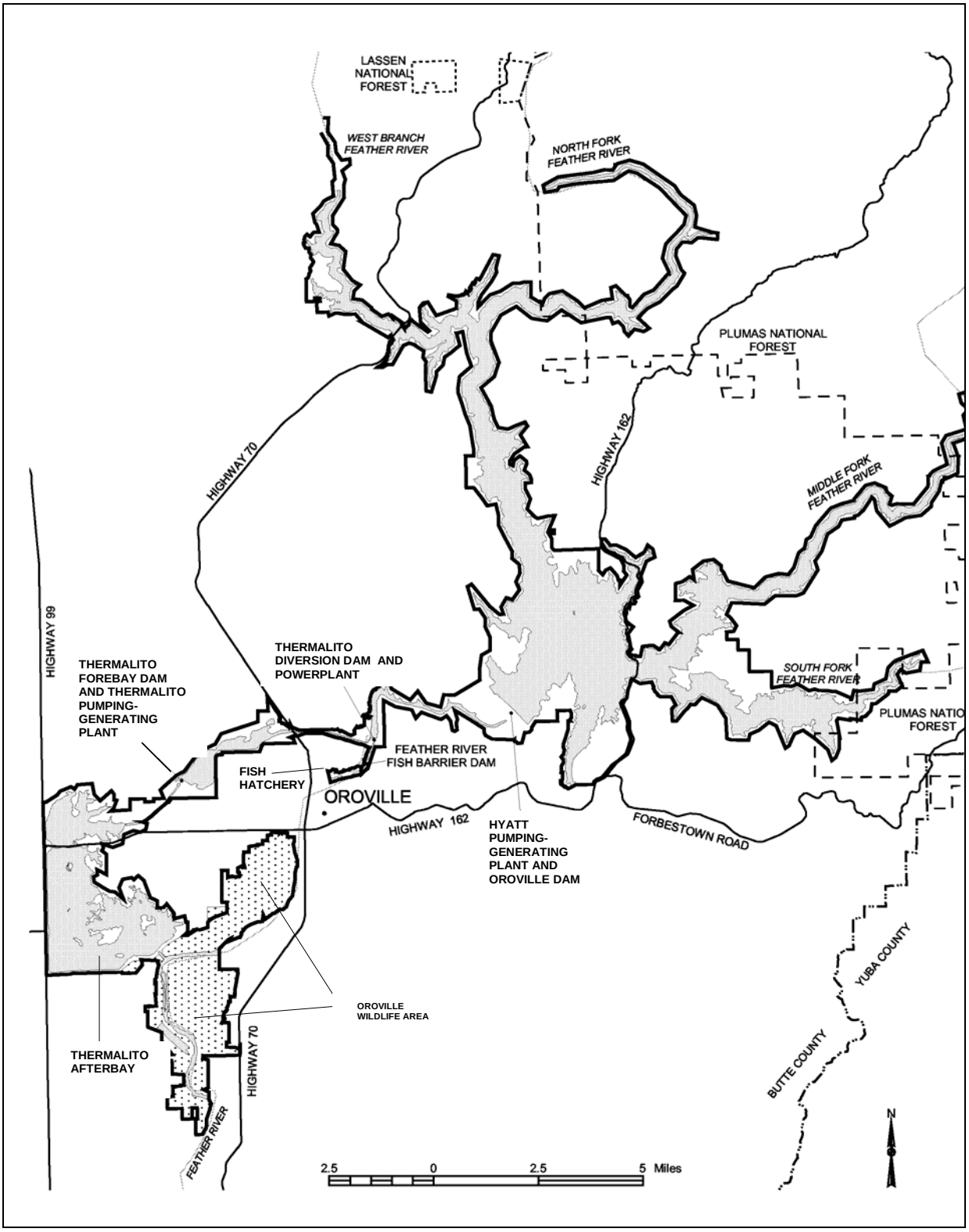

Figure A.1.1-1. Oroville Facilities features location map.

Thermalito Diversion Dam, four miles downstream of the Oroville Dam creates a tail water pool for the Hyatt Pumping-Generating Plant and is used to divert water to the Thermalito Power Canal. The Thermalito Diversion Dam Powerplant is a 3 MW power plant located on the left abutment of the Diversion Dam. The power plant releases a maximum of 615 cubic feet per second (cfs) of water into the river.

The Thermalito Power Canal is a 10,000-foot-long channel designed to convey generating flows up to 16,900 cfs to the Thermalito Forebay and pump-back flows to the Hyatt Pumping-Generating Plant. The Thermalito Forebay is an off-stream regulating reservoir for the Thermalito Pumping-Generating Plant.

The Thermalito Pumping-Generating Plant is designed to operate in tandem with the Hyatt Pumping-Generating Plant and has generating and pump-back flow capacities of 17,400 cfs and 9,120 cfs, respectively. When in generating mode, the Thermalito Pumping-Generating Plant discharges into the Thermalito Afterbay, which is contained by a 42,000-foot-long earth-fill dam. Thermalito Afterbay is used to release water into the Feather River downstream of the Oroville Facilities, helps regulate the power system, provides storage for pump-back operations, and provides recreational opportunities. Several local irrigation districts receive water from Thermalito Afterbay.

1.3 EXISTING ENVIRONMENTAL AND RECREATION COMMITMENTS

The Feather River Fish Barrier Dam is downstream of the Thermalito Diversion Dam and immediately upstream of the Feather River Fish Hatchery. The flow over the dam maintains fish habitat in the low-flow channel of the Feather River between the dam and the Thermalito Afterbay Outlet and provides attraction flow for the hatchery. The Feather River Fish Hatchery, an anadromous fish hatchery, was built to compensate for the loss of spawning grounds and rearing areas for returning salmon and steelhead trout and their offspring; the spawning grounds and rearing areas were lost due to construction of Oroville Dam. The hatchery has recently accommodated more than 20,000 adult fish and 15 million young fish annually.

The Oroville Facilities support a wide variety of recreational opportunities. These opportunities include: boating (several types), fishing (several types), fully developed and primitive camping (including boat-in and floating sites), picnicking, swimming, horseback riding, hiking, off-road bicycle riding, wildlife watching, and hunting. There are also visitor information sites with cultural and informational displays about the developed facilities and the natural environment. There are major recreation facilities at Loafer Creek, Bidwell Canyon, Spillway, North and South Thermalito Forebay, and Lime Saddle. Lake Oroville has two full-service marinas, five car-top boat launch ramps, ten floating campsites, and seven dispersed floating toilets. There are also recreation facilities at the Visitors Center and the OWA.

The OWA comprises approximately 11,000-acres west of Oroville that is managed for wildlife habitat and recreational activities. It includes the Thermalito Afterbay and surrounding lands (approximately 6,000 acres) along with 5,000 acres adjoining the Feather River. The 5,000-acre area straddles 12 miles of the Feather River, which includes willow and cottonwood-bordered ponds, islands, and channels. Recreation areas include dispersed recreation (hunting, fishing, and bird watching), plus recreation at developed sites, including Monument Hill Day Use Area, model airplane grounds, three boat launches on Thermalito Afterbay and two on the river, and two primitive camping areas. California Department of Fish and Game's (DFG) habitat enhancement program includes a wood duck nest-box program and dry land farming for nesting cover and improved wildlife forage. Limited gravel extraction also occurs in a number of locations.

2.0 DESCRIPTION OF EXISTING OROVILLE FACILITIES FEATURES

2.1 DAMS, RESERVOIRS, AND POWER FACILITIES

2.1.1 Lake Oroville

Lake Oroville stores winter and spring runoff that is released into the Feather River as necessary for project purposes. The reservoir is fed by the North, Middle, and South Forks of the Feather River. Average annual unimpaired runoff into the lake is about 4.2 maf.

Table A.2.1-1. Lake Oroville technical data.

Lake Oroville	Specification
Normal Maximum Water Surface Elevation	900 ft msl
Normal Minimum Water Surface elevation	640 ft msl
Drainage Area	3,624 square-miles
Maximum Storage	3.5 maf
Usable Storage	2.8 maf
Maximum Water Surface Area	15,810 acres
Shoreline length @ Maximum Storage	167 miles

Source: DWR Bulletin Number 200 – Volume III

2.1.2 Oroville Dam and Spillway

The Oroville Dam is the highest earthfill dam in the United States. The embankment is made up of an inclined impervious clay core resting on a concrete core block, with appropriate transitions and rock-filled shell zones on both sides.

The spillway, located on the right abutment of the dam, has two separate elements: a controlled gated outlet and an emergency uncontrolled spillway. The gated control structure consists of an unlined approach channel, gated headworks, and a lined chute. The concrete-lined chute, 3,050 ft long, extends from the flood control outlet down to a terminal structure where the water flows into the Feather River. The emergency uncontrolled spillway is designed so that water could flow over the emergency spillway weir and down the undeveloped canyon slope to the river.

The Palermo Outlet Works, concrete-lined and approximately 2,430 ft long, was designed to release water into the Palermo Canal located downstream of the Dam. It has two separate structures: intake portal and downstream portal. The intake portal structure consists of a short length of cut-and-cover tunnel section while the downstream portal structure consists of a concrete headwall and wingwalls paralleling the channel.

Table A.2.1-2. Oroville Dam, Oroville Dam Spillway, and outlet technical data.

Oroville Dam	
Type	Earthfill
Volume	80,000 cubic-yards
Height from Base of Dam	770 ft
Crest Elevation	922 ft msl
Crest Width	51 ft
Crest Length	6,920 ft
Oroville Dam Spillway	
Emergency Spillway	
Type	Overflow weir
Crest Elevation	901 ft msl
Crest Length	1,730 ft
Control Spillway	
Type	Gated outlet
Ogee Crest Elevation	813.6 ft msl
Control	8 radial gates, each 17ft-7in. wide by 33ft-6in. high.
Controlled Maximum Flow	150,000 cfs
Hoist	Electric
Palermo Outlet Works	
Tunnel	6 ft diameter with valve chamber
Capacity	40 cfs
Valve Type	12 in. fixed-cone dispersion valve
Intake Structure	
Length	27 ft
Invert Elevation	549 ft msl
Downstream Structure	
Flume type	Reinforced concrete
Flume width	5 ft
River Outlet	
Tunnel	Discharges into Diversion Tunnel No. 2
Capacity	5,400 cfs
Valve Type	Two 72 in. fixed-cone dispersion valves

Source: DWR Bulletin Number 200 – Volume III

Figure A.2.1-1. Lake Oroville and Oroville Dam.

2.1.3 Saddle Dams

Saddle Dams include Bidwell Canyon and Parish Camp and complement Oroville Dam in containing Lake Oroville. Bidwell Canyon Saddle Dam is located two miles southeast of Oroville Dam, consisting of two separate embankments. Parish Camp Saddle Dam is located on the West Branch arm of the reservoir and is 12 miles north of Oroville Dam.

Table A.2.1-3. Saddle dams technical data.

Bidwell Canyon Saddle Dam	
Type	Earth and rockfill
Height from Base of Dam	47 ft
Crest Elevation	922 ft msl
Crest Width	30 ft
Crest Length	2,270 ft
Embankment Volume	175,000 cubic yards
Side Slope	2.5:1
Parish Camp Saddle Dam	
Type	Earth and rockfill
Height from Base of Dam	27 ft
Crest Elevation	922 ft msl
Crest Width	30 ft
Crest Length	280 ft
Embankment Volume	11,000 cubic yards
Side Slope	2.5:1

Source: DWR Bulletin Number 200 – Volume III and Final Construction Report

2.1.4 Hyatt Pumping-Generating Plant

Most of the water released from Lake Oroville passes through Hyatt Pumping-Generating Plant, located in the left abutment of Oroville Dam. Water from the six-unit underground power plant is discharged through two tunnels into the Feather River just downstream of Oroville Dam.

The power plant facilities consist of an intake structure, two penstock tunnels, six penstock branch lines, an underground powerhouse, three turbine units, three reversible pump-turbine units, two tailrace tunnels and outlet works, a control building and a switchyard. The underground powerhouse measures approximately 550-ft long, 69-ft wide, and 140-ft high.

Three of the six generating units are conventional generators driven by vertical-shaft, Francis-type turbines; the other three are motor-generators coupled to Francis-type, reversible pump turbines. The latter units allow off-peak pumped-storage operations.

The intake structure for the power plant consists of two parallel intake channels, one each for two penstock tunnels. The intake openings are protected by stainless-steel trashracks. The intake structure has an overflow type shutter system, approximately 40-feet square, that determines the level from which water is withdrawn from Lake Oroville.

The main control building and a 230-kV switchyard are located above ground approximately 1,500 ft southwest of the underground powerhouse. Three overhead transmission lines extend approximately nine miles from the switchyard to PG&E's Table Mountain Substation.

Table A.2.1-4. Technical data for Hyatt Pumping-Generating Plant.

Specification	Pumping	Generating
License Capacity	519,000 hp & 5,610 cfs	645 MW & 16,950 cfs
Normal Static Head	500-660 ft	410-676 ft
Design Dynamic Head	592 ft	615 ft
Number of Units	3 (pumping/generating)	6 - (3 generating & 3 pumping/generating)
Unit Size	173,000 hp & 1,870 cfs	(g) 123 mVA & 2,850 cfs 3 (p/g) 115 mVA & 2,800 cfs
Penstock Diameter		2 @ 22 ft
Tailrace Diameter		2 @ 35 ft

Source: DWR Bulletin Number 200 – Volume IV

Figure A.2.1-2. Hyatt Pumping-Generating Plant.

2.1.5 Thermalito Diversion Dam, Diversion Pool, and Powerplant

2.1.5.1 Thermalito Diversion Dam

The Thermalito Diversion Dam is located approximately four miles downstream of Oroville Dam. The Thermalito Diversion Dam consists of a 625-foot-long concrete gravity dam with a regulated ogee spillway; and a canal-regulating headworks structure.

The dam has three purposes: (1) it diverts water into the two-mile long Thermalito Power Canal, which transports water to the Thermalito Pumping-Generating Plant for power generation; (2) it creates a tailwater pool (called the Diversion Pool) for the Hyatt Pumping-Generating Plant; and (3) provides headwater for the Thermalito Diversion Dam Powerplant.

2.1.5.2 Diversion Pool

The Diversion Pool acts as a forebay when the Hyatt Pumping-Generating Plant is pumping water back into Lake Oroville.

Figure A.2.1-3. Lake Oroville, Oroville Dam, and the Diversion Pool.

2.1.5.3 Thermalito Diversion Dam Powerplant

The Thermalito Diversion Dam Powerplant is a hydroelectric power plant located below the left abutment of the Thermalito Diversion Dam. The water flows into the Feather River to maintain fish habitat between the Thermalito Diversion Dam and the Thermalito Afterbay Outlet. The power plant facilities consist of an intake headworks, inlet pipes, a single penstock, an underground powerhouse with one turbine unit, a tailrace channel and outlet works. The powerhouse measures approximately 53-ft long, 50-ft wide, and

42-ft high. Two 15-kV underground distribution lines extend approximately 3.9 miles and 1.1 miles from Thermalito Diversion Dam Powerplant Switchyard to Hyatt Pumping-Generating Plant Switchyard and the Feather River Fish Hatchery, respectively.

Figure A.2.1-4. Thermalito Diversion Dam and the Thermalito Diversion Dam Powerplant.

Table A.2.1-5. Technical data for Thermalito Diversion Dam, Diversion Pool, and Thermalito Diversion Dam Powerplant.

Thermalito Diversion Dam	
Dam	
Type	Concrete gravity
Volume	154,000 cubic-yards
Height from Base of Dam	143 ft
Crest Elevation	233 ft msl
Crest Width	51 ft
Crest Length	1,300 ft
Spillway	
Type	Gated outlet
Crest Length	560 ft
Ogee Crest Elevation	205 ft msl
Control	14 radial gates, each 40ft wide by 23ft high.
Controlled Maximum Flow	320,000 cfs
Hoist	Electric
Power Canal Headworks	
Type	Gated outlet
Sill Elevation	200.5 ft
Control	3 radial gates, each 26.67 ft wide by 25.8 ft high.
Controlled Maximum Flow	16,900 cfs
Hoist	Electric
Diversion Pool	
Maximum Water Surface Elevation	225 ft msl
Minimum Water Surface elevation	221 ft msl
Maximum Storage	13,350 af
Maximum Water Surface Area	320 acres
Shoreline length @ Maximum Storage	10 miles
Thermalito Diversion Dam Powerplant	
License Capacity	3 MW & 615 cfs
Normal Static Head	63-77 ft
Design Dynamic Head	67 ft
Number of Units	1
Unit Size	3.3 MVA & 615 cfs
Inlet Lines Diameter	2 @ 5 ft
Penstock Diameter	1 @ 7.5 ft

Source: DWR Bulletin Number 200 – Volume III

2.1.6 Thermalito Power Canal

Thermalito Power Canal hydraulically links the Diversion Pool to the Thermalito Forebay and can convey water in either direction between the two facilities.

The headwork structure for the Thermalito Power Canal is located on the right abutment of the Thermalito Diversion Dam. The canal, 10,000 ft long, is designed to convey maximum generating and pumping flows of 16,900 cfs and 9,000 cfs, respectively. The canal is concrete-lined with bottom width of 48-ft and 1.5 to 1 side slope.

Figure A.2.1-5. Thermalito Diversion Dam and the Thermalito Power Canal.

2.1.7 Thermalito Forebay Dam and Forebay

2.1.7.1 Thermalito Forebay Dam

The Thermalito Forebay Dam is located about four miles west of the City of Oroville. The dam serves two purposes; (1) it creates a tailwater for the Hyatt Powerplant during pump-back operations; and (2) provides headwater for the Thermalito Pumping-Generating Plant.

2.1.7.2 Thermalito Forebay

Thermalito Forebay is an off-stream regulating reservoir for the Thermalito Pumping-Generating Plant. It is contained by the Thermalito Forebay Dam on the south and east and by Campbell Hills on the north and west.

The Forebay has three purposes: (1) it conveys generating and pumping flows between Thermalito Power Canal and Thermalito Pumping-Generating Plant; (2) it provides regulatory storage and surge damping for the Oroville Facilities; and (3) it serves as a recreational site.

Table A.2.1-6. Technical data for Thermalito Forebay Dam and Thermalito Forebay.

Thermalito Forebay Dam	
Type	Zoned Earthfill
Volume	1,840,000 cubic-yards
Height from Base of Dam	91 ft
Crest Elevation	231 ft msl
Crest Width	30 ft
Crest Length	15,900 ft
Thermalito Forebay	
Maximum Water Surface Elevation	225 ft msl
Minimum Water Surface elevation	222 ft msl
Maximum Storage	11,768 af
Maximum Water Surface Area	630 acres
Shoreline length @ Maximum Storage	10 miles

Source: DWR Bulletin Number 200 – Volume III

Figure A.2.1-6. Thermalito Forebay and Thermalito Forebay Dam.

2.1.8 Thermalito Pumping-Generating Plant

The Thermalito Pumping-Generating Plant is designed to operate in tandem with the Hyatt Pumping-Generating Plant to produce power during on-peak periods. The plant

provides generating and pump-back flow capacities of 17,400 cfs and 9,120 cfs, respectively.

The plant is an indoor type with an in-line arrangement of units. When in generating mode, the Thermalito Pumping-Generating Plant discharges into the Thermalito Afterbay via the Tail Channel. This channel is approximately 1.5-miles long and was constructed with 70-foot bottom width and 2:1 side slope.

Thermalito Pumping-Generating Plant Switchyard is located between the headworks structure and the powerhouse proper, utilizing a portion of the top deck of the powerhouse substructure. One 230-kV transmission line extends approximately 2.3 miles from the Switchyard to PG&E's Table Mountain Substation.

Table A.2.1-7. Technical data for the Thermalito Pumping-Generating Plant.

Specification	Pumping	Generating
License Capacity	120,000 hp & 9,120 cfs	114 MW & 17,400 cfs
Normal Static Head	85-102 ft	85-102 ft
Design Dynamic Head	99 ft	95 ft
Number of Units	3 (pumping/generating)	4 (1 generating & 3 pumping/generating)
Unit Size	40,000 hp & 3,040 cfs	3 (p/g) 30.6 MVA & 4,200 cfs
		1 (g) 34 MVA & 4,800 cfs
Penstock/Diameter		1 @ 24 to 21 ft
		3 @ 21 to 18 ft

Source: DWR Bulletin Number 200 – Volume IV

Figure A.2.1-7. Thermalito Pumping-Generating Plant.

2.1.9 Thermalito Facilities

2.1.9.1 Thermalito Afterbay Dam

The Thermalito Afterbay Dam is located about six miles southwest of the City of Oroville. It is a homogeneous earthfill dam with the longest crest in the SWP system. The dam contains the Thermalito Afterbay on the south and west and by higher natural ground on the north and east.

2.1.9.2 Thermalito Afterbay

The Thermalito Afterbay is an offstream reservoir that has four purposes: (1) it provides storage for the water required by the pump-back operation; (2) it helps regulate the power system; (3) it produces controlled flow in the Feather River downstream from the Oroville Facilities; and (4) it provides recreational opportunities.

Figure A.2.1-8. Thermalito Afterbay and Thermalito Afterbay Outlet.

2.1.9.3 Thermalito Afterbay Outlet

The Thermalito Afterbay Outlet is situated in the southeast corner of the Afterbay, a location most convenient for discharge to the Feather River downstream of the Thermalito Diversion Dam. Water released from the outlet provides for downstream project use, stream flow maintenance, and water-right commitments.

2.1.9.4 Thermalito Afterbay Irrigation Outlets

The irrigation outlet facilities regulate, measure, and record deliveries. Sizes of the outlets were determined by the necessity to meet discharge requirements at minimum reservoir level and match existing water levels in the canal system. These structures include Western Canal, Richvale Canal and Sutter-Butte Canal outlet.

Table A.2.1-8. Technical data for Thermalito Afterbay Dam, Thermalito Afterbay, Thermalito Afterbay Outlet, and Thermalito Afterbay Irrigation Outlets.

Thermalito Afterbay Dam	**Specification**
Type	Earthfill
Volume	5,020,000 cubic-yards
Height from Base of Dam	39 ft
Crest Elevation	142 ft msl
Crest Width	30 ft
Crest Length	42,000 ft
Thermalito Afterbay	
Maximum Water Surface Elevation	136.5 ft msl
Minimum Water Surface elevation	123 ft msl
Maximum Storage	57,040 af
Maximum Water Surface Area	4,300 acres
Shoreline length @ Maximum Storage	26 miles
Thermalito Afterbay Outlet	
Type	Gated outlet
Sill Elevation	105 ft msl
Control	5 radial gates, each 14 ft wide by 14 ft high.
Controlled Maximum Flow	17,000 cfs
Hoist	Electric
Thermalito Afterbay Irrigation Outlets	
Western Canal	
Type	Gated outlet
Flow Sensing Method	Flow Tubes
Invert of Gate Opening Elevation	105 ft msl
Control	5 radial gates, each 8 ft wide by 8 ft high
Richvale Canal	
Type	Gated outlet
Flow Sensing Method	Flow Tubes
Invert of Gate Opening Elevation	105 ft msl
Control	3 radial gates, each 6 ft wide by 6 ft high
Sutter-Butte Canal	
Type	Gated outlet
Flow Sensing Method	Overflow Weir
Invert of Gate Opening Elevation	102.75 ft msl
Control	4 radial gates, each 5 ft wide by 6 ft high

Source: DWR Bulletin Number 200 – Volume III

Western Canal and Richvale Canal outlets are combined in one structure and located in the northwest corner of Thermalito Afterbay. Western Canal outlet consists of five 96-inch-diameter conduits through the dam. The Richvale Canal outlet parallels these with 72-inch-diameter conduits. Each conduit is equipped with a slide gate at the upstream end to control flow. The Sutter-Butte Canal Outlet is situated on the south side of Thermalito Afterbay. It consists of four 7-foot-wide by 6-foot-high rectangular conduits founded on a concrete base slab, slide gates, a headwall with provisions for bulkheading, training walls, and an outlet channel approximately 1,200 ft long connecting to the existing Sutter-Butte Canal.

The controls for all irrigation outlets were designed to automatically adjust the slide gates to accommodate constantly changing head caused by afterbay fluctuations. Each

gate may be operated from any of three control stations as follows: at the gate hoist operator, in the separate outlet control houses, or in the remote control station located in the Oroville Area Control Center at the foot of Oroville Dam.

2.1.10 Transmission Facilities

Two sets of double circuit towers carrying three 230-kV circuits extend from the Hyatt Pumping-Generating Plant's 230-kV Switchyard to the Table Mountain Tap. One set of double circuit towers extends from the Thermalito Pumping-Generating Plant Switchyard to the Table Mountain Tap.

The distance from the Hyatt Pumping-Generating Plant 230-kV Switchyard to the Pacific Gas and Electric Company Table Mountain Substation is about nine miles. The distance from Thermalito Pumping-Generating Plant Switchyard to the Pacific Gas and Electric Company Table Mountain Substation is about 2.3 miles.

Also, two underground 15-kV power lines provide electric service to Thermalito Diversion Dam Powerplant and to the Feather River Fish Hatchery. One underground 15-kV power line, 3.9 miles long, connects Thermalito Diversion Dam Powerplant Switchyard with Hyatt Pumping-Generating Plant's Switchyard. The second underground 15-kV power line connects Thermalito Diversion Dam Powerplant with the downstream Feather River Fish Hatchery.

2.2 EXISTING ENVIRONMENTAL AND RECREATION COMMITMENTS

2.2.1 Feather River Fish Facilities

2.2.1.1 Fish Barrier Dam

The Feather River Fish Barrier Dam is downstream of the Thermalito Diversion Dam and immediately upstream of the Feather River Fish Hatchery. The flow over the dam maintains fish habitat in the low-flow channel of the Feather River between the Fish Barrier Dam and the Thermalito Afterbay Outlet. The dam diverts fish into a fish ladder that leads to the hatchery.

Table A.2.2-1. Technical data for the Fish Barrier Dam.

Fish Barrier Dam	Specification
Type	Concrete gravity
Volume	9,300 cubic-yards
Height from Base of Dam	91 ft
Crest Elevation	181 ft msl
Crest Length	600 ft

Source: Lake Oroville Website (Facility Statistics: Feather River Fish Hatchery)

Figure A.2.2-1. Fish Barrier Dam.

2.2.1.2 Fish Barrier Pool

The Fish Barrier Pool has a storage capacity of 560 acre-feet (af) and covers 50 acres. The shoreline covers one mile at gross capacity.

2.2.1.3 Feather River Fish Hatchery

The Feather River Fish Barrier Dam is downstream of the Thermalito Diversion Dam and immediately upstream of the Feather River Fish Hatchery. The flow over the dam maintains fish habitat in the low-flow channel of the Feather River between the dam and the Thermalito Afterbay Outlet and provides attraction flow for the hatchery. The Feather River Fish Hatchery, an anadromous fish hatchery, was built to compensate for the loss of spawning grounds and rearing areas for returning salmon and steelhead trout and their offspring; the spawning grounds and rearing areas were lost due to construction of Oroville dam. The hatchery has recently accommodated more than 20,000 adult fish and 15 million young fish annually.

Juvenile salmon and steelhead raised at the hatchery are transported by trucks in oxygenated, temperature-controlled tanks and released in the Feather and Sacramento Rivers, in Lake Oroville and other California reservoirs, and in San Pablo Bay near San Francisco Bay.

The facility is operated by the California Department of Fish and Game (DFG) and maintained by DWR.

Figure A.2.2-2. Feather River Fish Hatchery.

2.2.1.4 Fish Ladder

The Fish Barrier Dam and pool, located upstream of the Feather River Fish Hatchery, divert fish into a fish ladder that leads to the hatchery. The fish ladder consists of a series of “steps” and pools with the maximum drop between pools of one foot. Underwater passage of fish can be observed by visitors through 42-inch square viewing panels installed in the fish ladder wall.

An enlarged section of the fish ladder at its upstream terminus functions as a gathering tank, entrapping fish ascending the ladder. A mechanical sweep gathers the fish and

deposits them into the abutting spawning building. Four concrete circular tanks hold the fish until they are ready to spawn.

Table A.2.2-2. Technical data for the fish ladder.

Fish Ladder	Specification
Fish Ladder Length	2,150 ft
Pool Lengths	8 to 1000 ft
Pool Width	6 ft
Pool Depth	2 ft
Velocity	2 to 5 fps

Source: Lake Oroville Website (Facility Statistics: Feather River Fish Hatchery)

2.2.1.5 Hatchery Spawning Building

The Hatchery Spawning Building is where the artificial spawning takes place. Milt is taken from the male and mixed with eggs taken from the female. The eggs are kept in incubators capable of holding up to 25 million eggs.

The fry or young fish are held in incubators until they can be transferred to the rearing channels.

2.2.1.6 Rearing Raceways

Young fish (fingerlings and yearlings) are held in rearing channels until they are ready for release. The rearing channels are concrete-lined raceways blocked off in intervals to form 48 individual pools 100-ft long and 10-ft wide. Water flow and velocity in the raceways are 3 to 5 cfs at 0.1 fps. The raceways are covered with netting to protect the fish from predators such as hawks and herons.

2.2.1.7 Thermalito Fish Rearing Facilities

Located on the west side of the Thermalito Afterbay, the Thermalito Fish Rearing Facility is a set of fish rearing ponds used to raise salmon fry susceptible to the Sacramento River Chinook Disease (a coldwater virus) and young salmon. Its two rearing pond raceways can raise 2.5-million fingerlings for planting in San Pablo Bay or for study purposes.

2.2.1.8 Ultraviolet Water Treatment Facility

The treatment facility at the fish hatchery delivers disinfected water to the Thermalito Fish Rearing Facility and the rearing raceways to guard against the fall-run Chinook becoming diseased.

2.2.2 Recreation Facilities

2.2.2.1 Lake Oroville Visitors Center

Located east of the Oroville Dam on Kelly Ridge, the 10,000 square-foot center features exhibits on the engineering and construction of the hydropower facilities. Additionally,

there are interpretive displays on the native culture and the natural resources of the area. The center also has observation decks with various picnic tables and an observation tower. Visitors to Lake Oroville can also obtain specific information about recreational opportunities and activities in the area.

2.2.2.2 Marinas at Bidwell Canyon and Lime Saddle

Bidwell Canyon Marina

Bidwell Canyon Marina features include a fuel dock, pumping station for boat holding tanks, boat docks and storage, trailer facilities with RV hookups, and a seven-lane boat launching ramp. Bidwell Canyon Marina is located approximately one mile East of Oroville Dam on the southern shore of the lake.

Lime Saddle Marina

Lime Saddle Marina has a four-lane boat launching ramp, picnic facilities, boat dock and storage, fishing and boating supplies, gas and oil. The marina is located on the West Branch of the Feather River near Lime Saddle Road.

2.2.2.3 Spillway Recreation Area at Oroville Dam

The Spillway recreation area at Oroville Dam has the largest boat launching facility at Lake Oroville. A 12-lane ramp with over 800 parking spaces, recently renovated in 2002, is used during high water; an eight-lane second-stage ramp is used during low water. This site also provides limited day-use activities and opportunities for picnicking and bike riding.

2.2.2.4 Enterprise Boat Ramp and Day Use Area

The Enterprise ramp and day use area, located on the South Fork arm of Lake Oroville, provides boat launching and shoreline access. This site has a two-lane boat launch ramp used during high water (>820 ft above msl) and limited amenities. Amenities include a recently installed vault-type, handicap-accessible toilet.

2.2.2.5 Car-Top Boat Launch Ramps

These locations provide access to boaters launching canoes, small sailboats, and other small watercraft.

Dark Canyon

Dark Canyon Car-Top Boat Launch Ramp is located on the West Branch of the North Fork arm of Lake Oroville. This single-lane boat launch ramp is available at most water levels. There is a paved parking lot but no restroom.

Foreman Creek

Foreman Creek Car-Top Boat Launch Ramp is located on the north side of the main body of Lake Oroville. This two-lane boat launch ramp provides access at most water levels but has no developed parking area or restrooms.

Nelson Bar

Nelson Bar Car-Top Boat Launch Ramp is located on the West Branch of the North Fork arm of Lake Oroville. The lower section of the boat launch ramp, below the improved paved ramp, is passable by foot only. The site has a gravel parking lot, available at all but the highest water levels, and one vault toilet.

Stringtown

Stringtown Car-Top Boat Launch Ramp is located on the South Fork arm of Lake Oroville. The boat launch ramp is available at most water levels. This site has limited parking and one vault toilet.

Vinton Gulch

Vinton Gulch Car-Top Boat Launch Ramp is located on the West Branch of the North Fork arm of Lake Oroville. The single-lane boat launch ramp is used at high water. This site has no designated parking area and one vault toilet.

2.2.2.6 Campground and Day Use Areas

Bidwell Canyon Campground and Day Use Area

Bidwell Canyon Campground is located along the southern shore of Lake Oroville and to the west of Oroville Dam. This facility provides campsites for tents or RV's, the latter with full hookups. This site has flush toilets, piped water, showers, gray water sumps, and a picnic area with fire grills.

Lime Saddle Campground and Day Use Area

Lime Saddle Campground, built in 2001, is located on the western shoreline of the West Branch of the North Fork arm of Lake Oroville. This facility provides campsites for tents, RV's, and groups. This campground has restrooms, showers, and potable water; each site has a picnic table and fire grill.

Loafer Creek Campground, Day Use Area and Equestrian Camp

Loafer Creek Campground is the largest campground and is located on the southern shore of Lake Oroville east of Oroville Dam. This facility has campsites for tents, RV's, large groups and has an eight-lane boat launch ramp. The campground is equipped with restrooms, showers, piped water, gray water sumps, picnic table, and fire grills.

The Loafer Creek Equestrian Camp is equipped with shower stalls and feed troughs for horses. Restroom facilities and trailheads are located nearby. Recently, a paved access road, new feeder boxes, pipe corrals, and a 50-ft round pen were added at this location to provide enhanced equestrian recreational opportunities.

Table A.2.2-3. Campground information.

Campgrounds	Individual Sites	Group Sites
Bidwell Canyon	75	0
Lime Saddle	44	2*
Loafer Creek	137	6

**Each group site at Lime Saddle consists of 3 individual sites.*

Saddle Dam Day Use Area

This primarily equestrian-use trailhead, located in the southeastern portion of the project area, was recently improved by regrading and adding gravel to the parking area; adding picnic tables, a vault-type, handicap-accessible toilet, a water trough, and hitching posts for horses; and planting native shade trees.

2.2.2.7 Boat-in Campgrounds (BIC)

In addition to traditional campgrounds, Lake Oroville provides boat-in campgrounds around the lake. These camps are accessible only by boat and service vehicles and are popular during periods of high water. There are a total of 84 individual/family sites.

Bloomer Area

Bloomer Area Boat-in Campsites are located near the North Fork arm of Lake Oroville. Bloomer Area has four separate camp areas: Bloomer Cove, Bloomer Knoll, Bloomer Point, and Bloomer Group. The Bloomer Group is the only BIC in Bloomer Area that offers a group site (one 75-person group site). Each has campsites equipped with tables and fire rings with cooking grills.

Craig Saddle

Craig Saddle Boat-in Campground is located between the Middle and South arms of Lake Oroville. This area has 18 sites, each equipped with tables, potable water, and fire rings with cooking grills.

Foreman Creek

Foreman Creek Boat-in Campground is located at the north side of Lake Oroville. This site is equipped with potable water, gray water sump, tables, and fire rings with cooking grills.

Goat Ranch

Goat Ranch Boat-in Campground is located on the North Fork arm of Lake Oroville between the Bloomer campgrounds, where the West Branch splits off of the North Fork arm. This site is equipped with tables and fire rings with cooking grills.

Table A.2.2-4. Boat-in campground information.

Boat-in Campgrounds	Individual Sites	Toilets
Bloomer Cove BIC	5	2
Bloomer Knoll BIC	6	2
Bloomer Point BIC	24	4
Craig Saddle BIC	18	4
Foreman Creek BIC	26	4
Goat Ranch BIC	5	4

Source: Draft Study Report R-10 and R-10 edited

2.2.2.8 Floating Campsites and Restrooms

Lake Oroville has ten floating campsites that are anchored in different areas of the reservoir. Each is a two-story structure that can accommodate up to 15 people, with living space and amenities such as cooking grill, table, sink, restroom, and sleeping area.

There are seven floating restrooms on Lake Oroville to preserve water quality and provide convenience for boaters. They are stationed around the lake and each has two individual restrooms with vaults that are periodically pumped-out.

2.2.2.9 Diversion Pool Day Use Area

The Diversion Pool Day Use Area is open for day-use activities such as hiking, biking, trail access, and picnicking. Only non-motorized and electric boats are allowed in this area. This site has one vault toilet but few other amenities.

2.2.2.10 North Thermalito Forebay Recreation Area

The North Thermalito Forebay area offers picnicking, swimming, as well as en-route camping. Boating is restricted to non-motorized boats such as sailboats and canoes (electric motors allowed). The boat launch area has two 2-lane boat launch ramps. There are numerous picnic tables, group facilities and shade ramadas, and a popular sand beach.

2.2.2.11 South Thermalito Forebay Recreation Area

The South Thermalito Forebay Recreation Area provides outdoor recreational activities such as boating, picnicking, fishing and swimming. The site has a two-lane boat launch ramp with power boating limited to 330-acres of the 630-acre pool. The site has several picnic tables with fire grills. A vault-type, handicap accessible toilet was recently installed at this location.

2.2.2.12 Monument Hill Day Use Area

Monument Hill Day Use Area provides recreational activities such as boating, swimming, fishing, picnicking and limited hunting. This site has 10 picnic tables, 4 flush toilets, a two-lane boat launching ramp, and a fish cleaning station.

2.2.2.13 Thermalito Afterbay Boat Launch Ramps

Larkin Road Boat Launch Ramp

The Larkin Road boat launch area has a graded and graveled car-top boat launch ramp. This site has a paved lot approximately 50-yards by 50-yards with a single-vault toilet.

Monument Hill Boat Launch Ramp

The boat launch ramp consists of a two-lane paved boat launch ramp with a floating dock and is located on the eastern shoreline of the Thermalito Afterbay. The paved and unpaved parking lots are able to accommodate about 75 car/trailer combinations.

Wilbur Road Boat Launch Ramp

The Wilbur Road boat launch area consists of a two-lane paved boat launch ramp, a parking lot with 14 car/trailer combination spaces and a vault-type handicap accessible toilet.

2.2.2.14 OWA Primitive Camping Area

OWA primitive camping is allowed in one designated area. There are minimal amenities for users. The OWA provides for wildlife habitat and recreational opportunities, including hunting, fishing, nature viewing, camping, biking, horseback riding, picnicking, and boating. Portions of the OWA are managed to provide nesting and foraging cover for resident and migratory waterfowl.

2.2.2.15 Equestrian, Bicycle, and Hiking Trails

Dan Beebe Trail

The Dan Beebe Trail has both difficult and easy terrain. The Loafer Creek Horse Camp is available for those who plan to spend more than one day riding on the trails. The horse camp is equipped with shower stalls and feed troughs for the horses. Restroom facilities and trailheads are also located nearby.

Brad Freeman Trail

The 41-mile Brad Freeman Trail circles the Thermalito Forebay, Thermalito Afterbay, and the Diversion Pool, and crosses the crest of Oroville Dam. It was constructed in the mid-1990s as a mountain-bicycle trail, but became popular with equestrians and it is now considered a multipurpose trail. There are about a dozen popular or marked

access points, many at other popular Project recreation sites, from which trail users can stage. The mostly-unsurfaced trail provides scenic off-road recreation, but some short sections are along paved roads and can be used by less-specialized bicycles. More than 30 miles of the trail are flat but include some rolling terrain; steep grades can be found on either side of Oroville Dam. The Freeman Trail has also been used for downhill and cross-country mountain-bicycle races. DWR recently completed a group staging area at Thompson Flat that includes signage, a graveled driveway to Cherokee Road, graded parking, and a spur trail from the staging area to an existing trail.

Hiking Trails

Most of the hiking trails at Lake Oroville are located in the Bidwell Canyon and Loafer Creek areas; however, there is also a trail in the Spillway area. Informal trails offering shoreline access are found at Thermalito Afterbay, the Craig Saddle area, and the Foreman Creek Car-top BR area. Hiking trail locations and access points in the project area include Bidwell Canyon, Kelly Ridge, Loafer Creek, Potters Ravine, Wyk Island, the Saddle Dam, Powerhouse Road, Lakeland Boulevard, East Hamilton Road, Toland Road, Tres Vias Road, and the Visitors Center Chaparral Interpretive Trail.

The Maidu Sewim Bo River Trail was recently developed along the eastern bank of the Feather River starting at the Nature Center and extending north to the Thermalito Diversion Dam. Amenities include picnic tables, shade ramadas, restrooms, and interpretive signage.

The Freeman Trail provides 41 miles of scenic off-road recreation, popular among riders of all-terrain bikes. The trail circles the Thermalito Forebay, Thermalito Afterbay, and includes the crest of Oroville Dam. About 30 miles of trail are mainly flat but include some rolling terrain; steep grades can be found on either side of the dam within a two mile distance from Lake Oroville. A portion of the bike trail is paved and the rest is either dirt or gravel.

2.2.3 Interim Projects

Early in the ALP, DWR agreed to consider implementing some actions before receiving a new license provided no license amendment was needed, no environmental review was required, and there was agreement to include the actions in the new license application when filed. These interim projects are listed below and discussed in further detail in Section 3.1.2.2 of the PDEA:

- Restroom Upgrades at Wilbur Boat Ramp, Model Aircraft flying facility, Enterprise Boat Ramp, South Thermalito Forebay and Bidwell Saddle Dam;
- Loafer Creek Equestrian Camp Improvements;
- Group Staging Area at Thompson Flat;
- Bidwell Bar Bridge Exhibit;

- Saddle Dam Improvements;
- Lake Oroville Overlook Improvements;
- Reseed Oroville Dam;
- Model Aircraft Flying Facility Improvements;
- Promote Existing Recreation Facilities along SR 99;
- Boating Safety Training;
- Maidu Sewim-Bo River Path; and
- FRH Landscaping Improvements.

2.2.4 Oroville Wildlife Area

2.2.4.1 Introduction

The OWA comprises approximately 11,000- acres west of Oroville that is managed for wildlife habitat, recreational activities and gravel mining. It includes the Thermalito Afterbay and surrounding lands (approximately 6,000 acres) along with 5,000 acres adjoining the Feather River. The 5,000 acre area straddles 12 miles of the Feather River, which includes willow and cottonwood lined ponds, islands, and channels. Recreation areas include dispersed recreation (hunting, fishing, hiking, and bird watching), plus recreation at developed sites, including Monument Hill day use area, model airplane grounds, three developed boat launches on the Afterbay and two unimproved ramps on the river, and two primitive camping areas. California Department of Fish and Game's (DFG) habitat enhancement program includes a wood duck nest-box program and dry land farming for nesting cover and improved wildlife forage. Limited gravel extraction also occurs in a number of locations.

2.2.4.2 Habitat Activity Areas

The DFG is responsible for operation and maintenance of the OWA. A significant amount of their activity is taken up with garbage collection throughout the area. However, several significant efforts have been undertaken to enhance the vegetation communities and wildlife habitat.

Brood Ponds

DWR and the California Waterfowl Association (CWA) in consultation with DFG worked to establish five brood ponds for waterfowl within the Thermalito Afterbay. Due to the changing water elevation, waterfowl were having a difficult time establishing nests and hatching offspring. It was decided to establish small, dammed areas in shallow end bays throughout the Afterbay. When the water of the Afterbay started to drop or rise, the shoreline within the brood pond areas would remain more stable thereby allowing

nesting waterfowl the opportunity to continue without being inundated by water. Ongoing maintenance activities include thinning/removal of vegetation to provide better access to water areas and the construction/installation of wood duck boxes. This habitat management activity has been very successful and resulted in significant numbers of waterfowl within the Afterbay and adjacent lands.

Habitat Enhancement

DFG conducts habitat enhancement programs throughout the entire OWA. However, most of this activity consists of planting nesting and foraging vegetation cover for waterfowl, 85 percent of which is in and around Thermalito Afterbay.

2.2.4.3 Recreation Activity Areas

The Thermalito Afterbay and preserve are heavily used by the public for hunting, fishing, and recreation. These activities are described below.

Camping

Currently, there are three camping locations in the OWA. There are two improved campgrounds next to the Thermalito Afterbay Outlet (southeast corner of the Afterbay). These locations include vault restrooms, picnic tables, and trash receptacles. A dirt boat ramp in the northern campground provides access to the Feather River. One other unimproved campground is located on the northwest end of One Mile Pond (near the southern end of the preserve).

Boating Facilities

Two improved and one semi-improved boat ramps are provided for powerboat and watercraft access to the Thermalito Afterbay. The improved boat ramps include Monument Hill (east side of the Afterbay) and Wilber Road just off Highway 162 in the northeast corner of Thermalito Afterbay. The Larkin Road location is a semi-improved boat ramp in the southeast section of Thermalito Afterbay. There is also a semi-improved boat ramp that provides access to the Feather River adjacent (north) to Thermalito Afterbay Outlet. The Monument Hill location also includes several improvements such as a paved parking lot, picnic tables, barbecue pits, and vault toilets.

Boating and Water Skiing

The three improved boat ramps provide public access for boating and water skiing recreational activities on the Thermalito Afterbay. A water ski slalom course was installed in the southeastern corner of the Afterbay. The area is heavily used by water ski boats, pleasure and fishing boats, and personal watercraft (jet skis). Sailboarding is also a popular activity.

Picnicking

Facilities for picnicking activities are limited to those located at Monument Hill located on the east side of Thermalito Afterbay. The area includes several picnic tables with permanent barbecue facilities, a paved boat ramp, parking facilities, and vault toilets.

Hunting

Hunting is one of the primary activities at the OWA and involves bird and mammal hunting, as permitted according to the hunting season. Only shotguns or bows and arrows are allowed in the OWA. Rifles and pistols are not allowed for hunting in the OWA. There are approximately 150,000 to 200,000 user days per year at the OWA related to both hunting and fishing. There are diverse hunting seasons throughout the year that include the following primary animals of interest:

In addition to the scheduled hunting seasons, the DFG sponsors two/year, junior (kids under 16) pheasant hunts with stocked birds.

Fishing

Fishing at the OWA provides some of the best opportunities within the State of California. Fish in the Feather River include anadromous species such as: Chinook salmon, steelhead, shad, stripped bass, and sturgeon. Salmon and steelhead fishing is best in fall and winter; shad and striped bass seasons peak in late spring. Anglers can also fish for largemouth and smallmouth bass, bluegill, crappie, brown bullhead, and carp. The Afterbay and dredger ponds throughout the area include bass, blue gill, cat fish, and crappie. In years past, the DFG stocked fish in the dredger ponds but no longer continues that activity.

Bird Watching

The OWA provides many opportunities for bird watching and has been designated as a “significant bird area” by the Audubon Society. It provides a year-round home for at least 128 species of birds and 12 species of mammals. Common game birds include mourning dove, California quail, ring-necked pheasant, and migrating flocks of band-tailed pigeons. Bird and nature study is excellent during the spring.

2.2.4.4 Gravel Mining

DWR maintains numerous contracts with local companies for the mining and use of gravel within the preserve portion (southern half) of the OWA. These areas are all located within the flood plain of the Feather River and provide significant gravel resources for projects throughout the surrounding county.

3.0 DESCRIPTION OF PROPOSED NEW FACILITIES

DWR does not propose any modification to the Oroville Facilities that would either add new generation equipment or increase the generating capability of the existing three power plants. However, DWR does propose continuing to operate and maintain the Oroville Facilities for electric power generation with new environmental and recreational enhancements under the Proposed Action. These enhancements could be either structural and/or operational improvements that would affect future project costs and/or the amount of annual generation.

4.0 LANDS OF THE UNITED STATES

The Federal lands within the Oroville Facilities project boundary include a total of 6,200 acres of land owned by the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS). The BLM lands total 4,600 acres and the USFS lands total 1,600 acres.

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